BIOFIL®
RESEARCH & DEVELOPMENT

BIOFIL

Bacterial product for soil inoculation 'Soya'

Importance of soya:

Soya is one of the most important oil-, and protein-containing crops, it is produced on vast areas of the arable land. Soybeans represent the basic commodity of numerous food industry products, and play an important role as feed component as well. Therefore the area of soya cultivation increases year to year, a tendency observed in the EU, too. According to the general European trend, member countries increase soya production in order to become less dependent on soybean import and the current EU policy also tries to avoid the procession of GMO soya.
In concordance with the tendency above, the soybean market develops in the direction of excellent quality, high-end products both for the food industry or agriculture (e.g. non-GMO soya) even in spite of higher prices.
We, the co-workers of BioFil Ltd. intend to help our Partners by offering microbiological soil inoculant products especially for soybean production, containing beneficial rhizobacteria and technologies for their use in field. Our products are based on constant innovation, able to improve the quality and quantity traits of soya yield, together with the reduction of fertilizer input.

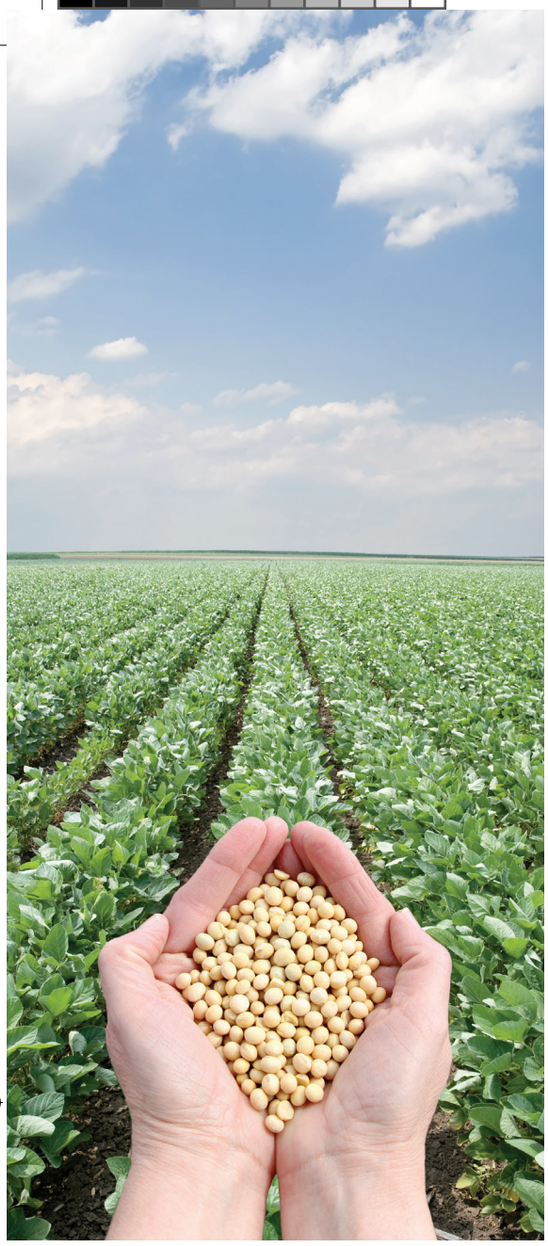
Our approach supplies the sustainable agriculture, the products can also be used legitimately in organic farming.

A relevant condition of soya production success – according to the symbiotic nature of soya plant – is the appropriate nodulation on the roots. Accordingly, the bacterial inoculation of soya is a high priority task. The nodule forming bacterium (*Bradyrhizobium japonicum*) is not native in the majority of soils and its quantity decreases significantly with the rotation of crops, therefore regular inoculation is necessary for proper soybean development.

BioFil Ltd. has developed the BIOFIL® Soya soil inoculation technology, which has been introduced to field production for three years and it is becoming more and more popular based on its effectivity. The soil inoculation technology comprises combined use of the BIOFIL® Soya (0,4 l/ha) and the soil-pH specific BIOFIL® Acidic, BIOFIL® Normal or BIOFIL® Alkaline (1 l/ha) soil inoculants (according to the soil pH). The technology significantly improves nodule formation and plant development, and therefore supports increase in yield quantity and quality as well.

The 5-5 biggest soya growing countries of the world and Europe, according to FAO, 2016

World's 5 biggest soya growing countries	Produced quantity (tonnes)	The 5 biggest „European" soya growing countries	Produced quantity (tonnes)
United States of America	117.208.380,-	Ukraine	4.276.990,-
Brazil	96.296.714,-	Italy	1.081.340,-
Argentina	58.799.258,-	Serbia	576.446,-
India	14.008.000,-	France	338.864,-
China	11.966.328,-	Romania	263.380,-



Results from our monitored facility researches, 2016.

Place of trial: Hungary, Győr-Moson-Sopron county, Mosonudvar
Soil properties: Donau alluvial soil, pH 7.55; humus content 1.62%
Nutrient supply: 300 kg/ha 7-20-30 NPK, 100 kg NAC 27%
Type of soya: ES Mentor
Treatments:

1. Inoculated and dipped (NPPL HiStick, Vitavax) soya sowing seed, 5 ha (control)
2. Inoculated and dipped (NPPL HiStick, Vitavax) soya sowing seed, and soil inoculation with BIOFIL® Soya (0.4 l/ha) + BIOFIL® Normal (1 l/ha), 20 ha

Water content and crop yield when harvested, 2016

Treatment	Water content (%)	Crop (t/ha)*	Weight of 1000 seeds (g)*
NPPL (control)	13,4	4,17	198,278
BIOFIL®	10,4	5,13	255,519

Water content is lower with 3% when harvested!

23% crop yield increase!

* Corrected to 13,0 % of water content.

Nutrient content parameters, 2016

Treatment	Crude protein (%)	Crude oil (%)	ProFat (%)
NPPL (kontroll)	33,65	19,10	52,8
BIOFIL®	35,63	18,23	53,9

Protein content higher with 1,98%!

Full-fat soya of high quality!

Protein content of soya is reverse-proportional with the oil content. The ProFat rate, which is the quality index of full-fat soya, combines both of them. According to the ProFat rate, soya treated with BIOFIL® inoculating technology results in high-end full-fat soya material.
Outstanding yield quality and quantity results depend on sufficient nodulation of the soybean plants.

Effects of BIOFIL® soil inoculation on forming of nodules in several periods of development

Rate of nodulated plants (%)			
Treatment	Time of record		
	Start of blossoming (R1)	Start of pod forming (R3)	Seed maturation (R6)
NPPL (HiStick)	75	80	75
BIOFIL®	90	90	100
	+15%	+10%	+25%

Inoculating the soil with BIOFIL® increases the number of nodulated plants up to 90-100% by flowering and forming of pods (R1-R3), and seed maturation (R6), when plant demands its maximum nitrogen supply. Active nodules resulted in higher protein content and ProFat rate in the R6 period.

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